WHAT IS CLAIMED IS:

1. A method for forming a trench having rounded corners in a semiconductor device, the method comprising:

providing a semiconductor substrate;

forming a first pad oxide layer, a first silicon nitride layer, and a first oxide layer on the semiconductor substrate sequentially;

removing portions of the first oxide layer, the first silicon nitride layer, the first pad oxide layer, and the semiconductor substrate to form at least one trench;

removing portions of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer in the trench above an upper corner of the semiconductor substrate in the trench, the semiconductor substrate including a lower corner at a bottom of the trench;

forming a second pad oxide layer in the trench;

forming a second silicon nitride layer on the second pad oxide layer and the first oxide layer;

removing portions of the second silicon nitride layer to expose the second pad oxide layer on the corners and the bottom of the trench;

forming a thermal oxide layer on the second pad oxide layer exposed by removing the portions of the second nitride layer; and

removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer.

2. The method of claim 1 wherein removing portions of the first oxide layer, the first silicon nitride layer, the first oxide layer, and the semiconductor substrate is performed by a photolithography process or an etching process.

3. The method of claim 1 wherein the at least one trench has a depth of between about 1μm and about 3μm and a width of about 0.2μm and about 1μm.

4. The method of claim 1 wherein removing portions of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer in the trench is performed using HF.

5. The method of claim 1 wherein the second silicon nitride layer is formed by deposition.

6. The method of claim 1 wherein removing portions of the second silicon nitride layer to expose the second pad oxide layer is performed by dry etching.

7. The method of claim 1 wherein the thermal oxide layer is formed by thermal oxidation.

8. The method of claim 1 wherein removing the second nitride layer, the thermal oxide layer, and the second pad oxide layer is performed with phosphoric acid.

9. The method of claim 1 further comprising forming a second oxide layer in the trench and on the first oxide layer after removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer.

10. The method of claim 1 wherein the second pad oxide layer is formed over surfaces of the semiconductor substrate in the trench.

11. The method of claim 1 wherein removing portions of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer in the trench exposes the upper corner of the semiconductor substrate in the trench.

12. The method of claim 1 wherein removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer forms a rounded upper corner and a rounded lower corner of the semiconductor substrate in the trench for a trench-type metal oxide semiconductor device.

13. A method for forming a trench having rounded corners in a semiconductor device, the method comprising:

providing a semiconductor substrate having thereon a first pad oxide layer, a first silicon nitride layer on the first pad oxide layer, and a first oxide layer on the first silicon nitride layer, and at least one trench extending through the first oxide layer, the first silicon nitride layer, and the first pad oxide layer, and partially through the semiconductor substrate; wherein the trench is enlarged above the semiconductor substrate along sidewalls of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer; wherein the semiconductor substrate includes a lower corner at a bottom of the trench and an upper corner below the sidewalls of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer;

forming a second pad oxide layer in the trench;

forming a second silicon nitride layer on the second pad oxide layer and the first oxide layer;

removing portions of the second silicon nitride layer to expose the second pad oxide layer on the corners and the bottom of the trench;

forming a thermal oxide layer on the second pad oxide layer exposed by removing the portions of the second nitride layer; and

removing the second silicon nitride layer, the thermal oxide layer and the second pad oxide layer.

14. The method of claim 13 further comprising forming a second oxide layer in the trench and on the first oxide layer after removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer.

15. The method of claim 13 wherein the second pad oxide layer is formed over surfaces of the semiconductor substrate in the trench.

16. The method of claim 13 wherein removing portions of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer in the trench exposes the upper corner of the semiconductor substrate in the trench.

17. The method of claim 13 wherein removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer forms a rounded upper corner and a rounded lower corner of the semiconductor substrate in the trench.

18. A method for forming a trench having rounded corners in a semiconductor device, the method comprising:

providing a semiconductor substrate having thereon a first pad oxide layer, a first silicon nitride layer on the first pad oxide layer, and a first oxide layer on the first silicon nitride layer, and at least one trench extending through the first oxide layer, the first silicon nitride layer, and the first pad oxide layer, and partially through the semiconductor substrate; wherein the trench is enlarged above the semiconductor substrate along sidewalls of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer; wherein the semiconductor substrate includes a lower corner at a bottom of the trench and an upper corner below the sidewalls of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer; wherein a second pad oxide layer is formed in

the trench and a second silicon nitride layer is formed on the second pad oxide layer and the first oxide layer;

removing portions of the second silicon nitride layer to expose the second pad oxide layer on the corners and the bottom of the trench;

forming a thermal oxide layer on the second pad oxide layer exposed by removing the portions of the second nitride layer; and

removing the second silicon nitride layer, the thermal oxide layer and the second pad oxide layer.

19. The method of claim 18 wherein removing portions of the first oxide layer, the first silicon nitride layer, and the first pad oxide layer in the trench exposes the upper corner of the semiconductor substrate in the trench; and wherein the second pad oxide layer is formed over surfaces of the semiconductor substrate in the trench.

20. The method of claim 18 wherein removing the second silicon nitride layer, the thermal oxide layer, and the second pad oxide layer forms a rounded upper corner and a rounded lower corner of the semiconductor substrate in the trench for a trench-type metal oxide semiconductor device.